

# NAVAL MEDICAL RESEARCH AND DEVELOPMENT NEWS

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## Navy Deputy Surgeon General Visits NAMRU-San Antonio

By Joe N. Wiggins, NAMRU-San Antonio Public Affairs

Seeing the capabilities and facilities of one of the Navy's newest biomedical research laboratories and witnessing the joint environment in which its personnel work was the goal behind the recent visit of one of the Navy's top medical officers to the Naval Medical

Research Unit-San Antonio ([NAMRU-San Antonio](#)).

Rear Admiral Michael H. Mittelman, the Navy's Deputy Surgeon General (DSG), toured NAMRU-San Antonio's facilities and watched the staff at the Battlefield Health and Trauma Research Institute and the Tri-Service Research Laboratory. The admiral visited more than twenty labs, work stations

and other settings demonstrating the latest NAMRU-San Antonio research projects and capabilities.

"This was very valuable for me, to see firsthand the great work our men and women are doing in facilities like NAMRU-San Antonio," said Mittelman. "The information I gathered will be useful to me in my role as the DSG."

Dr. Rene Alvarez, principal researcher in the Dental and Biomedical Research Department, demonstrated work underway to identify key proteomic and genomic biomarkers and how they relate to exposure to viruses and bacteria.

"The utilization of proteomic and genomic biomarkers as a rapid diagnostic for identifying infections in our warfighters is the ultimate goal of our current research," said Alvarez. "Right now,

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Executive Assistant to the Surgeon General Capt. Terry Moulton (left, rear) and Deputy Surgeon General Rear Adm. Michael H. Mittelman (center rear) observe a procedure as part of the study "Exploratory Testing of Hemorrhage and Life Support Strategy," which aims to better control blood loss due to injuries. The procedure was conducted by Dr. Jason Rall (right front) and assisted by Jennifer Cox (left front).

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## Commanding Officer's Message

Memorial Day was first observed May 30, 1868, when flowers were placed on the graves of Union and Confederate soldiers in Arlington National Cemetery. Ever since, Americans have set aside that day in May to pay tribute to those who made the ultimate sacrifice in defense of our great nation. And this year on Memorial Day, as on so many in the past, our sailors, Marines, soldiers and airmen are globally engaged in defense of freedom. Many brave servicemen and women have given their lives to defend our liberty and uphold the promise of our democracy. Because of their selfless service and sacrifices, we are blessed to experience peace, prosperity and independence.

Please take a moment to pause and reflect on the meaning of Memorial Day. We should celebrate Memorial Day and all it represents, but we must celebrate safely. Keep watch over each other. The loss of any one of our NMRC military or civilian employees due to a preventable holiday mishap would be a tragedy for family and loved ones and a tragic loss to our NMRC enterprise. The Navy Safety Center provides great information for holiday safety on their website, [www.safetycenter.navy.mil](http://www.safetycenter.navy.mil). Another good resource is TRiPs, an online, automated risk-assessment tool. You can use it before you go on leave when you are going to be driving distances on the holiday. The system helps you recognize—and avoid—the hazards faced on the highway: fatigue, not buckling up and driving too far.



Commanding Officer sends,  
Richard L. Haberberger, Jr.  
CAPT, MSC, USN

## NSMRL, Duke ID Multi-gene Signature of Decompression Stress

*Provided by NSMRL Public Affairs*

Physiologists from the Naval Submarine Medical Research Laboratory (NSMRL) in Groton, Conn. and Duke University Medical Center have teamed up to identify a multi-gene signature of decompression stress. In the past, Genome-wide Expression Profiling (GWEP) has been used for identification and validation of gene expression patterns associated with cardiovascular disease processes.

"Our hypothesis is that comparing gene expression before and after human decompression exposures by GWEP will provide insight into biological pathways and potential molecular markers associated with decompression stress," said Dawn Kernagis, the project's lead investigator at Duke University.

The study involved analyzing the genomic changes from 93 hyperoxic, mixed-gas experimental dives conducted at the Navy Experimental Diving Unit and 27 normoxic experimental decompression exposures conducted

at NSMRL. In addition, separate control experiments were conducted at NSMRL to determine the genomic changes resulting from hyperbaric oxygen exposures and mild exercise conducted at surface pressure as well as the differences occurring in the gene signature between morning (7:00 a.m.) and afternoon (5:00 p.m.) without any intervening diving exposures.

"The control experiments were conducted to rule out changes in the genomic signature that were due to hyperoxia (oxygen stress), exercise and circadian rhythms," said Dr. David Fothergill, the lead investigator at NSMRL.

The study found that GWEP of peripheral blood following decompression exposures identifies a reproducible multi-gene signature of differentially expressed genes, primarily comprising genes associated with the immune response that was independent of the level of decompression stress.

"These findings provide a glimpse into the physiological systems affected by decompression stress and offer an



*The Naval Submarine Medical Research Laboratory genesis hyperbaric chamber where some of the experimental decompression dives were conducted.*

avenue for further focused research that could aid in finding adjunctive or non-recompression therapies to mitigate the potential harmful effects of high levels of decompression stress that can lead to decompression sickness. Such research would have direct relevance to the fleet and combat divers who are exposed to decompression stress during diving operations as well as in the management and treatment of disabled submarine survivors," said Fothergill.



## Army and Navy Team Host Ribbon Cutting for Laboratory Suite

By Doris Ryan, NMRC, and  
Caree Vander Linden, USAMRIID

Army and Navy officials at Ft. Detrick hosted a ribbon cutting ceremony for a newly renovated laboratory suite located in the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) building, March 29. Leaders from USAMRIID and the Naval Medical Research Center (NMRC) welcomed guests and staff members and invited them to tour the Biosafety Level 3 containment laboratory suite where scientists from NMRC's Biological Defense Research Directorate (BDRD) will continue their mission of detecting infectious diseases and testing new vaccine candidates and therapeutics.

Capt. J. Christopher Daniel, deputy commander, U.S. Army Medical Research and Materiel Command, said the ribbon cutting ceremony marked the next chapter in a long history of Army and Navy personnel working together in medical research. From 1999 until very recently, BDRD was located in the Daniel Inouye Building that the Navy shares with the Walter Reed Army Institute of Research (WRAIR), according to Daniel.

"Now, once again, BDRD will be doing its critically important work in a joint environment—this time with USAMRIID," he remarked. "Here at Fort Detrick, we have the opportunity to work together with our other federal partners in the National Interagency Confederation for Biological Research, or NICBR. Together, our work will benefit the warfighter as well as our fellow citizens in the U.S. and throughout the world."

Last October, the Navy relocated BDRD from Silver Spring, Md. to a new 36,600-square-foot building at Ft. Detrick as part of the latest Base Realignment and Closure (BRAC) effort. The new Navy facility contains office space and standard (non-containment) laboratories. The renovation of the USAMRIID laboratory suite, known as B-1, marks the completion of the BRAC initiative by also providing BDRD with Biosafety Level 3 labora-



*From left: Capt. Richard L. Haberberger, NMRC Commander; Col. Bernard L. DeKoning, USAMRIID Commander; and Capt. J. Christopher Daniel, USAMRC Deputy Commander cut the ceremonial ribbon on a newly renovated Biosafety Level 3 suite at USAMRIID that will be occupied by NMRC's Biological Defense Research Directorate. Photo by William Discher.*

tory space essential to its research mission.

"Sharing this facility with our Navy partners required a lot of work behind the scenes to make the renovation happen in five short months," said Col. Bernard L. DeKoning, commander of USAMRIID. "We are excited about having our Navy counterparts here working with us as part of the NICBR collaboration. Our joint work is going to do great things on behalf of the American people, our warfighters and global health."

Capt. Richard L. Haberberger, commanding officer of NMRC, expressed his gratitude to Col. DeKoning's personnel for all their support during the relocation period.

"His staff did an outstanding job in coordinating, implementing and ensuring that our needs were met," Haberberger said. "In addition, the facilities department did an outstanding job during the renovation phase."

According to Haberberger, the new B-1 suite at USAMRIID will allow Navy researchers to continue conducting rapid and accurate diagnostics of se-

lect agents using the latest molecular and immunological assays.

"BDRD is also making significant progress in vaccine research, and this area is going to be an incredible asset for their work," he added. "Once we are settled in and the suite is fully operational, we hope to establish collaborative research projects with our NICBR partners in the near future."

BDRD is a world leader in detection and confirmatory analysis of infectious diseases of biothreat importance. The BDRD team is working to improve field detection kits, develop better antibodies, make full use of new vaccine delivery technologies and assist international partners in detecting and handling natural or man-made infectious disease threats.

USAMRIID's mission is to protect the warfighter from biological threats and to be prepared to investigate disease outbreaks or threats to public health. Research conducted at USAMRIID leads to medical solutions—vaccines, drugs, diagnostics and information—that benefit both military personnel and civilians.

## NHRC's Millennium Cohort Study Logs Over 180,000 Participants



Over 180,000 service members and veterans are currently participating in the Millennium Cohort Study conducted by researchers at the Naval Health Research Center (NHRC) in San Diego. The study team expects to surpass the 200,000 participant mark by the end of this year.

"As force health protection continues to be a priority for the future of the U. S. military, the Millennium Cohort Study will be providing critical information towards enhancing the health of future generations of military members," said Dr. Nancy Crum-Cianflone, principal investigator of the Millennium Cohort Study and department head of the NHRC Deployment Health Research Department.

In response to health concerns related to military members about deployment and other service-related experiences, the Department of Defense (DoD) initiated the Millennium Cohort Study – the largest prospective study ever undertaken in the U.S. military. Launched in 2001, the goal of this study is to create a cohort that best represents all service members as well as the broad scope of military experiences.

"Participants are asked to complete one survey every three years, up through the year 2022," said Crum-Cianflone. "This is necessary in order to follow developments in health over

an extended period of time. While approximately 30 percent of cohort participants have left military service, they remain active members of the cohort."

The study team has been incredibly productive with providing the DoD, Veterans Administration, and scientific community with information in over 50 publications and 200 presentations. Here are some of the recent findings:

- Physical activity, especially vigorous activity, for at least 20 minutes twice weekly was associated with decreased odds of reporting post-traumatic stress disorder (PTSD) symptoms.
- Service members deployed to Iraq and Afghanistan may experience problems with their sleep both during and after deployment. Data showed they were 28 percent more likely to have trouble sleeping than non-deployed service members.
- Mental health status before a stressful experience, such as combat experience during deployment, might affect the reaction during the traumatic event and coping strategies after the event, and may explain why some members develop conditions such as PTSD post-deployment
- Findings showed that personnel deploying to the operations in Iraq and Afghanistan had a higher rate of persistent or recurring cough or shortness of breath (14 percent) than non-deployers (10 percent). However, there are no indicators for an increased risk for asthma,

chronic bronchitis or emphysema. Follow-up studies are underway.

In addition to the service member study, the NHRC team launched the Millennium Cohort Family Study in 2011. The purpose of the family study is to gain a more complete understanding of the military experience and its impact on the health and well-being of service members and their families.

***"As force health protection continues to be a priority for the future of the U. S. military, the Millennium Cohort Study will be providing critical information towards enhancing the health of future generations of military members."***

Individuals included in the family study are the spouses of participants in the Millennium Cohort Study. Participation in the family study is completely voluntary. There are currently over 2,500 military spouses enrolled.

NHRC conducts research in the medical and psychological aspects of health and performance among military personnel. For more information on NHRC and the Millennium Cohort Study, visit <http://www.med.navy.mil/sites/nhrc>.

## NMRC Working with Air Force on Biological Agent ID Detection

*From BDRD Public Affairs*

For the last two years, the Biological Defense Research Directorate (BDRD) of the Naval Medical Research Center (NMRC) has performed as the Naval Sea Systems Command (NAVSEA) head of quality assurance and proficiency testing (QA/PT) for the

Joint Biological Agent Identification and Detection System (JBAIDS). In 2012, BDRD gained a new customer under its standardized QA/PT program. BDRD's Operations Department is now the head of QA/PT for the U.S. Air Force Medical Support Agency Medical Readiness Directorate.

"Our quality assurance and

proficiency testing program has now received a joint flavor," said the head of the Operations Department, Lt. Cmdr. Matthew Weiner. "Our program will now provide support and maintenance to 59 USAF sites throughout the world." BDRD, a member of the National Interagency Confederation for  
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## Widow of Renowned Navy Medical Scientist Visits NMRC

Hope Phillips and two of her sons, Robin and Wilkie Phillips, paid an informal visit to the Naval Medical Research Center (NMRC) March 26. Phillips is the widow of the late Capt. Robert Allan Phillips, one of the Navy's most acclaimed medical scientists. While serving as the Commanding Officer of U.S. Naval Medical Research Unit No. 3 (NAMRU-3), Cairo, Egypt from 1947-1952 and U.S. NAMRU-2, then located in Taipei, Taiwan, from 1955-1965, Capt. Phillips directed pioneering studies on cholera that elucidated its pathophysiological effects and demonstrated the remarkable efficacy of balanced intravenous rehydration. Capt. Phillips and his research team also provided the first rational proof-of-principle for oral fluid replacement in the treatment of cholera in the early 1960s in the Philippines. This work paved the way for the development of oral rehydration therapy for diarrhea, touted as the most important medical advance of the twentieth century by the *Lancet*.

Visiting family in the area, Phillips came to NMRC with her sons, meeting informally with Capt. Stephen Savarino, head of NMRC's enteric diseases research program, and Dr. Stephen Walz, NMRC's field laboratory liaison. They reminisced about times and work overseas. Before departure, Phillips peeked in on the Robert Phillips Conference Room (Room 1A06, WRAIR/NMRC Building 503), and talked about appointing the room with her late husband's



*Hope Phillips stands outside the WRAIR/NMRC conference room named in honor of her late husband.*

1967 Albert Lasker Award and other memorabilia to serve as an inspiration for today's military medical scientists in their pursuit of advances that will tangibly improve human health.

## Welcome Aboard to Alexandra Mora, NMRC's New Ombudsman

This spring, the Naval Medical Research Center (NMRC) welcomed a new Command Ombudsman. Alexandra Mora, the wife of Lt. Brian L. Pike, volunteered to



*Capt. Haberberger welcomes NMRC's new ombudsman, Alexandra Mora.*

take over the role from Dr. Angela Prouty, who is relocating to Cambodia with her husband, Lt. Michael Prouty.

Born and raised in Bogota, Colombia, Mora immigrated to the United States in 1996. Since making the United States her home, Mora's career has largely been focused on public health related topics that range in scope from improving the clinical management of chronic diseases to securing access to services for individuals in underserved communities and counseling victims of domestic abuse.

The ombudsman's role is to help service members and especially their families navigate the stresses and many challenges that the military often places upon them. In this way, Mora is hopeful that her past training and experience will be an asset to NMRC and the Navy more generally. Being relatively new to the Navy herself, Mora says she's excited by the opportunity to serve as NMRC's ombudsman because in addition to helping others in the military, the role is a chance to learn more about the Navy community that is now such a large part of her family's life.

In addition to her role as the new ombudsman, Mora will begin studies this fall as a graduate student at the University of Maryland, where she will be pursuing a degree as a Clinical Nurse Leader. The degree will allow her to continue her interest in public health and in meeting the needs of her community. Mora and her husband currently reside in Baltimore.



## NAMRU-3 Builds Infectious Disease Surveillance Capacity in Iraq

Earlier this year, the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) in Cairo, Egypt, and the Department of State sent a three-person team to Erbil, Iraq, to build an infectious disease surveillance capability.

The team conducted a monitoring and evaluation assessment at Rizgary Teaching Hospital, which is the Surveillance for Severe Respiratory Illness Program (SARI) sentinel surveillance site in Erbil.

"The meetings focused on the surveillance procedures and system that will be implemented and the data management readiness processes. An overview was presented to the entire hospital physician staff," said Shaun Truelove, NAMRU-3 epidemiologist. "In a country where it is continually challenging to work, this trip was a big success and will initiate the SARI program in Iraq, something we have been working towards for several years now."

On visits to the Erbil Central Public Health Lab (CPHL), Central Veterinary Lab, and Rizgary Hospital lab, the



*At the Rizgary Teaching Hospital, from left: Dler Mukhtar Asif, Rizgary Hospital; Lt. Cmdr. Brent House, NAMRU-3; Shaun Truelove, NAMRU-3; Dr. Younis Mustafa Rasul, Rizgary Hospital; Dr. Abdullah Faqiyazdin, Rizgary Hospital.*

team evaluated laboratory standards and testing practices. Team members inventoried and installed equipment

and discussed current progress and future collaboration.

Collaborators from Rizgary, the Kurdistan Ministry of Health, and Erbil CPHL successfully finalized details and responsibilities for initiating the SARI surveillance program in Erbil and integrating it in the Eastern Mediterranean Acute Respiratory Infection Surveillance Network.

Lt. Cmdr. Brent House, head of NAMRU-3's Global Disease Detection and Response Program, was happy to report that, "Upon completion of this trip, SARI is 100 percent ready to begin in Erbil."

The other member of the team was Ellen Manning, U.S. Department of State Iraqi Scientist Engagement Program project coordinator.

The mission of NAMRU-3 is to study, monitor and detect emerging and re-emerging disease threats of military and public health importance and to develop mitigation strategies against the threats in partnership with host nations and international and U.S. agencies in the Central Command, European Command and Africa Command areas of responsibility.



*At the Erbil Central Veterinary Lab (CVL): Ellen Manning, U.S. State Department (left) and Dr. Elham Potrose, CVL director (center).*



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field doctors and surgeons need up to several days to identify the cause of an infection. We are hoping to reduce that to hours or even minutes by using point-of-care devices and information learned in our labs.”

The admiral viewed two other demonstrations in the Dental and Biomedical Research Department: the progress and work done in the areas of mercury abatement and mercury filtering research. Dr. Wayne Deutsch showed Mittelman the Atomic Absorption Spectrometer, which detects seven different elements, including mercury, down to the parts-per-trillion level. Capt. Michael F. Rocklin demonstrated the latest in mercury abatement filters installed in a typical dental chair application, which gives dental clinics on shore and at sea the ability to remove mercury waste from dental rinse water at a level never before possible.

“We are expecting a new and strict standard to be introduced by the EPA soon that will require dental offices to ensure they are not contaminating waste water systems with mercury,” said Deutsch. “This machine will give us a quick and accurate way for Navy clinics to ensure they are meeting and exceeding that requirement.”

“Our Mercury Abatement Filters, developed at NAMRU-San Antonio, are being shipped and installed in Navy dental clinics right now,” said Rocklin. “We are helping our fellow sailors ensure they are being environmentally responsible so they can focus on delivering the best dental care available.”

Within the Combat Casualty Care Department, Dr. Diane Bienek briefed Mittelman about research on the accuracy of commercial blood typing kits in real-world deployments.

“The kits may have been designed for the climate control environment of a lab or clinic, but we need to ensure they are also accurate in a 100-plus degree remote location that may be far away from the nearest medical facility,” explained Bienek.

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*Capt. Michael F. Rocklin (kneeling) of NAMRU-San Antonio shows the Mercury Abatement Filter installation on a typical dental chair to Navy Deputy Surgeon General Rear Adm. Michael H. Mittelman (right) during his visit to the unit. Also observing (from left) were NAMRU-San Antonio Executive Officer Cmdr. Theodore St John, NAMRU-San Antonio researcher James Hoffman and NAMRU-San Antonio Commanding Officer Capt. Vincent DeInnocentiis.*



*Navy Deputy Surgeon General Rear Adm. Michael H. Mittelman (left) and Air Force Deputy Surgeon General Maj. Gen. Thomas Travis (center) observe as Dr. Wayne M. Deutsch of the NAMRU-San Antonio Dental and Biomedical Research Department explains what the Atomic Absorption Spectrometer does and how it works. This was part of a tour and demonstration of ongoing projects at the unit to DSGs during a recent visit to NAMRU-San Antonio.*

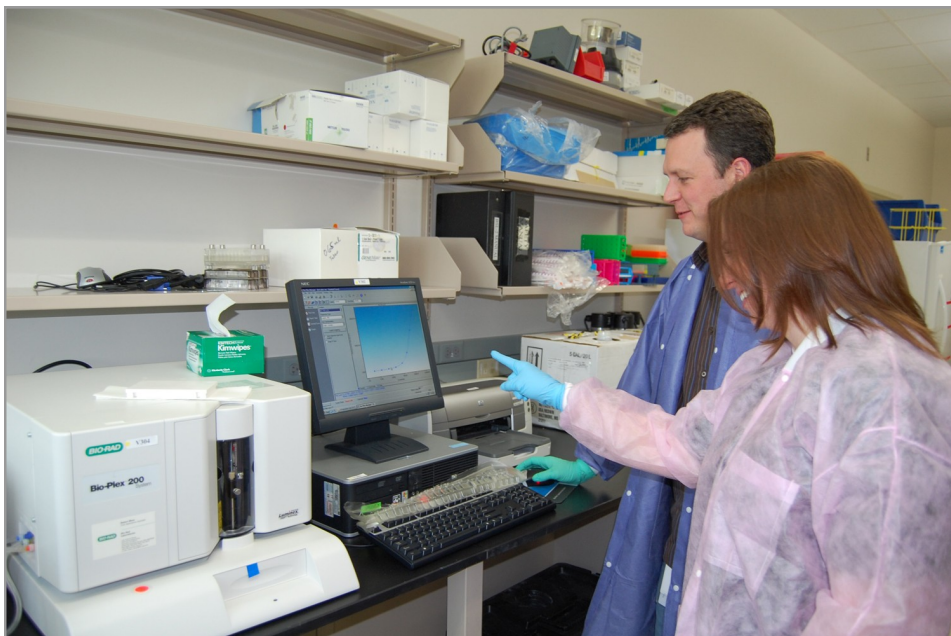
## BDRD Department Earns Kudos from DARPA in “Live Fire” Exercise

How quickly can a medical countermeasure against an unknown infectious disease be created and deployed to the field? That was the question addressed by the Vaccines and Medical Countermeasures Department of the Biological Defense Research Directorate (BDRD), Naval Medical Research Center (NMRC), during a recent live-fire exercise.

“Emerging disease threats, man-made or natural, have the potential for serious consequences within days to weeks of exposure,” said Dr. Andrea Keane-Myers, the head of the department. “However, countermeasures against infectious disease typically take years or decades to discover, develop and deploy by conventional approaches. That is one of the reasons the Defense Advanced Research Projects Agency (DARPA) sponsored a seven-day biodefense program exercise.”

The DARPA program supports highly innovative approaches to counter any known, unknown, naturally occurring or engineered pathogen using novel technologies to prevent infection, extend survival, provide transient immunity or speed the onset of adaptive immunity.

“In this live-fire exercise, where investigators tested an unknown viru-



*Drs. Kevin Schully (left) and Angela Prouty of the Biological Defense Research Directorate's Vaccines and Medical Countermeasures Department were lead contributors to the group's outstanding performance in a recent rapid countermeasure response exercise for Defense Advanced Research Projects Agency (DARPA).*

eral possible configurations of a vaccine that extended survival of the exercise's vaccinated groups by 80-100 percent against an otherwise lethal infection. The group also distinguished itself while providing biosafety level 3 support for another participant

Keane-Myers.

The department's approach to the exercise drew on several aspects of their research portfolio, including microparticle encapsulation for antigen delivery, immune enhancement of vaccines using rationally based immune-stimulating adjuvants, rapid protective responses, and vaccine production techniques for removing toxins from whole-cell extracts. Other aspects of their portfolio investigate novel vaccine delivery systems, vaccine target discovery, passive immunity for post-exposure treatment and novel vaccine production methods.

This well rounded medical countermeasure program is further integrated into BDRD's overall strategies for biological defense. BDRD's genomics group can characterize novel agents for genetic and biochemical features that can be exploited for detection, prevention and treatment, while the immunodiagnostics and molecular diagnostics departments use the unique characteristics of biological agents to develop assays for agent detection.

***“...BDRD researchers, with collaborators at the Ohio State University, delivered outstanding results using their own novel approach....”***

lent agent, BDRD researchers, with collaborators at the Ohio State University, delivered outstanding results using their own novel approach. The department also contributed beyond expectations with the testing of another group's technical approach,” said Keane-Myers.

The BDRD group's approach was to develop a novel delivery platform that could rapidly produce an immune response against the unknown agent. During the exercise, they tested sev-

in the program. These successes demonstrated BDRD's capability for conducting state-of-the-art medical countermeasure research as well as for partnering with other government, academic and private sector organizations in biodefense research.

“This live-fire exercise proved to be something of a paradigm shift, as we succeeded in manufacturing and implementing a medical countermeasure in real time without needing a *priori* knowledge of the agent,” said



## Underlying Causes of 2011 Influenza Outbreak at Fort Jackson

The open-access biomedical journal PLoS One (Public Library of Science; <http://www.plos.org/>) published findings from a team led by scientists at the Naval Health Research Center (NHRC) that document a large outbreak of influenza at the Army recruit training center at Fort Jackson, S.C. in January 2011. Influenza A and B viruses result in – on average – 36,000 cases of mild to severe illness in the United States each year, at times leading to hospitalizations or deaths mostly in infants or older patients. The 2009 influenza pandemic, resulting from the appearance of a new variant of A/H1N1 virus (pH1N1), was noteworthy given the high percentage of morbidity and mortality among previously healthy

young people.

Influenza vaccination provides protection against two influenza A viruses and one influenza B virus. Mutations in the extracellular receptors of influenza viruses as a result of deficient “proofreading” mechanisms cause antigenic “drift” from the vaccine strain, necessitating annual changes. To counter outbreaks of influenza, the Department of Defense inoculates newly arriving recruits with either the trivalent inactivated influenza vaccine (TIV) or, due to its earlier availability, the live attenuated influenza vaccine (LAIV). In the early months of 2011, febrile respiratory illness surveillance conducted by NHRC and supported by the Armed Forces Health Surveillance

Center (AFHSC) evidenced 64 pH1N1 cases – including one death – among LAIV-vaccinated recruits at Fort Jackson. Few cases of influenza A/H3N2 or Influenza B occurred in this population, although all three viruses circulated in the region. These findings suggested reduced effectiveness for the pH1N1 component of the 2010-2011 influenza vaccine.

To understand the contributing factors behind the increased rates of pH1N1 infection during the outbreak, investigators undertook a serological study to describe the corresponding antibody responses. Sera were drawn four to five weeks post-vaccination from recruits at Fort Jackson; the Ma-

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While at TSRL, Mittelman watched a portion of a study on exploratory testing of hemorrhage and life support strategy, which aims to better control blood loss due to injuries. The procedure conducted by Dr. Jason Rall provides statistical data on the various ways to stop and control bleeding in potential wounds or injuries.

Dr. Jeremy Beer, principal investigator in the Directed Energy Biomedical Research Department, explained some of the recent data he and a team collected in the field while testing a combined laser and acoustic signal system designed to enhance maritime security and defense. The data was collected over water using volunteers as test subjects and measured their ability to receive and understand the signals used in the testing.

“We wanted Rear Adm. Mittelman to see what we have put in place since moving into these facilities that give us a much wider range of options to conduct biomedical research,” said Capt Vincent Delnno-centiis, commanding officer of NAMRU-San Antonio. “This allows us to better support warriors on the sea and on land than ever before in our history. His support and understanding of our mission is invaluable to us as we complete the research we’ve been tasked to perform.”



Executive Assistant to the Surgeon General Capt. Terry Moulton (left) and Deputy Surgeon General Rear Adm. Michael H. Mittelman (center) listen and ask questions of NAMRU-San Antonio Capt. Michael F. Rocklin on the workings of the Mercury Abatement Filter Rocklin is holding.

## NHRC Conducts Pre-Deployment Training for Mobile Care Team

*From NHRC Public Affairs*

The Mobile Care Team (MCT) is a five-person, individually augmented team deployed for six months to conduct mental health surveillance using the Behavioral Health Needs Assessment Survey (BHNAS). The survey results show in-theater unit leadership the stress levels of sailors, unit morale, cohesion and deployment-stressors.

MCT 6's pre-deployment training was provided by the Naval Health Research Center (NHRC), Naval Center Combat Operational Stress Control, and BUMED/M9. NHRC has served as the performing agency for the development, support and analysis of the BHNAS survey and data since late 2006.

"I believe the MCT pre-deployment training provided by NHRC truly exemplifies proactive leadership," said Cmdr. Ruth Goldbert, licensed clinical social worker on the team. "By providing us with the integral training, tools and resources, NHRC has proven that they are genuinely devoted to this mission, are truly committed to our success as a Mobile Care Team; and most importantly, are profoundly invested in the wellbeing of our deployed individual augmentee (IA) sailors."

MCT 6's training focused on the background of BHNAS, the content areas (e.g., mental health outcomes, risk factors and protective factors), survey processing, data cleaning and data analysis. The team was provided a demonstration of the unit debrief they will be giving to unit leaders and conducted a mock data collection and analysis scenario.

NHRC also provides reach-back support for the Mobile



*Two Navy IAs from Forward Operating Base Sharana, Paktika Province, Afghanistan, complete BHNAS surveys while sharing their own unique IA experiences.*

Care Teams, so this pre-deployment training not only prepared the team members for their in-theater mission, but also will maximize team cohesion between the MCT and NHRC's BHNAS team.

Lt. Cmdr. Katie Shobe led the NHRC portion of pre-deployment training. (Shobe deployed as part of Mobile Care Team 2.) Other NHRC team members who participated in the training include Susan Hilton, Shiloh Beckerley and Marc Taylor.

## NMRC Working with Air Force on Biological Agent ID Detection

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Biological Research at Ft. Detrick in Frederick, Md., currently supports the U.S. Navy Fleet, including all aircraft carriers, large deck amphibious ships and hospital ships with this biowarfare confirmation capability.

The proficiency testing and evaluation provided by the BDRD team is of vital importance to the Department of Defense biological weapons testing platforms. It evaluates individual technical proficiency of the Navy and Air Force technicians, assists in tracking reagent performance and surveys the ability of the Navy and Air Force laboratories to test and evaluate actual biological samples. BDRD's JBAIDS QA/PT program will increase confidence in the quality of the testing results and decrease the risk of false

negative results. BDRD also conducts annual visits to make sure the laboratory technicians are maintaining their skills on the JBAIDS platform. This in turn raises the operational readiness standards across the board.

"The BDRD staff is very excited about this opportunity and they are looking forward to providing this capability to the Air Force because it shows how DoD looks to Navy Medicine for this very valuable service," said BDRD deputy director Cmdr. Guillermo Pimentel. "It is important for the services to share assets and work together in the joint arena. Now the Navy and Air Force will have one standardized testing program, which will create a more uniform approach towards QA/PT for the JBAIDS platform."

BDRD works to advance research and develop therapeutics to protect against biological attacks. Established in 1992, BDRD is a leader in detection and confirmatory analysis for bio-threat agents. Researchers develop real-time polymerase chain reaction-based assays for rapid detection and confirmatory testing. These assays, which are a cornerstone of the directorate's extensive analytical capability, detect a threat agent's unique DNA signature. With an eye on the future, BDRD is striving to improve field detection kits, develop better antibodies for use in vaccine development, make full use of new vaccine delivery technology, and assist international partners in detecting and handling natural or man-made infectious diseases threats.



## An Old Friend Moves Back to O'ahu After a 63-year Absence

From [NAMRU-2 Pacific](#) Public Affairs

The recent emergence (re-emergence) of the yellow fever mosquito, *Aedes aegypti*, which has not been an inhabitant of the island of O'ahu for over 63 years, has caused quite a stir in a normally laid back community. Well known on the Big Island, its re-emergence is a cause for alarm on O'ahu, as the mosquito is known to transmit debilitating diseases such as dengue fever, yellow fever, chikungunya fever and other pathogens. Unlike its more O'ahu-established "cousin," the Asian Tiger mosquito, *Aedes albopictus*, it is a much more efficient vector of disease due to its biology and behavior, especially its preference for feeding on humans indoors.

This is of particular concern due to last year's outbreak on O'ahu of dengue fever and the more recent outbreaks of dengue as seen in the Republic of the Marshall Islands and Yap, Federated States of Micronesia.

Dengue is a mosquito-borne viral infection found in tropical and subtropical climates worldwide. It causes a severe flu-like illness also known as "breakbone fever" and sometimes develops into a potentially lethal complication called dengue hemorrhagic fever (DHF). There is no specific treatment or vaccine for



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dengue, but appropriate medical care frequently saves the lives of patients with the more serious form, DHF. The only way to prevent transmission is to combat the disease-carrying mosquito.

Infected humans are the main carriers and multipliers of the virus for uninfected mosquitoes. The virus circulates

in the blood of infected humans for two to seven days, at about the same time that they have a fever. Female *Aedes* mosquitoes may pick up the virus when they feed on a sick individual during this period. Once a female mosquito becomes infected, she can transmit the virus for the rest of her life.

## Underlying Causes of 2011 Influenza Outbreak at Fort Jackson

(Continued from page 9)

rine Corps Recruit Depot, Parris Island, S.C.; and the Coast Guard Training Center in Cape May, N.J. Specialized tests utilizing reagents prepared by the Centers for Disease Control and Prevention (CDC) were conducted on paired sera. Additionally, contemporaneous influenza isolates were genetically analyzed for changes in the hemagglutination gene (HA). In the PLoS publication, the investigators show that the level and affinity of serum antibodies generated in response to influenza vaccination in the recruit population varied by vaccine type (TIV vs. LAIV) and differed significantly when the locally circulating pH1N1 virus was

compared to the vaccine strain. The authors concluded that decreased serologic response among recruits corresponded to modest antigenic drift in the subclade of pH1N1 viruses circulating at Fort Jackson in 2011.

The implications of these findings on the 2011-2012 influenza season remain uncertain. Cmdr. Dennis J. Faix, the lead author of the PLoS publication, said, "The current influenza season has been unusual. There have been very few influenza cases in the continental United States, so it is difficult to determine whether the pH1N1 subclade involved in the 2011 outbreak at Fort Jackson has become the predominant or fixed strain."

Cmdr. Patrick J. Blair, the head of Operational Infectious Diseases at NHRC, added, "Recruits are a special population. We have little understanding of the effects of stress, crowded environments and multiple and simultaneous vaccinations on their ability to mount an effective immune response. In this instance, modest drift in the infecting subclade tipped the balance of protection following LAIV vaccination."

This work accentuates the need for continuous surveillance tied to timely virus characterization and agile production of vaccines and therapeutics in response to ever-adapting influenza viruses.

## Exit Interviews Provide Insight on NMRC Work Environment

"The other day I did an exit interview with HM2 Timothy Velasco," said Capt. Richard L. Haberberger, Jr., commanding officer at the Naval Medical Research Center (NMRC). "I asked him if NMRC made him a better sailor? Did NMRC help him reach his educational goals? His comments really impressed me because of his enthusiasm and his achievements. I asked him if I could share his comments with the NMRC enterprise."

Velasco responded to Haberberger's questions with an enthusiastic "Yes, Sir!" during the exit interview held April 24.

"NMRC helped me get involved in projects and technology that I enjoyed," Velasco said. "I also was able to travel the world and teach the science that I was taught at NMRC. As for my education, NMRC 'overqualified' me for my courses for my degree in Laboratory Management at the University of Maryland University College. There were many times when my professors thought I was lying about the work I did and that I was copying articles from the Internet for papers I had to write because they thought it was impossible for someone to know as much as I did about polymerase chain reaction technology



HM2 Timothy Velasco (left) and Capt. Richard L. Haberberger, Jr., commanding officer, NMRC, during Velasco's exit interview April 24.

Research Directorate fit perfectly with the degree he is working on. The knowledge and experience he received helped him excel in his coursework and satisfied his scientific curiosity.

HMC Jerry Diederich, the command

strategies on biological warfare defense. A tour at NMRC provides a unique opportunity for sailors to receive detailed training on cutting-edge medical laboratory equipment and procedures."

Velasco will finish his degree December 2012. He will continue his education by pursuing a Master's degree in Biotechnology Studies: Biotechnology Management. As for now, his next duty station takes him to Naval Health Clinic Quantico in Quantico, Va. He is looking forward to his position as a clinical laboratory technician where some of his responsibilities will be drawing blood and testing samples for illnesses.

"Being at NMRC has been very advantageous and rewarding," said Velasco. "That is why I tell every Navy lab tech I know, at one point in your naval career you have to get stationed at NMRC!"

In the next two to three months, the NMRC enterprise plans to receive eleven hospital corpsmen and one Yeoman, with more sailors following soon after.

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and DNA and immunology without having a degree. After proving to my professors, which required a lot of convincing, they were astonished. I soon was able to help the professors teach courses, tutor my peers in courses such as Biology and Natural Science, and assist students who were having trouble in the course."

Velasco told Haberberger that working at NMRC's Biological Defense

chief, acknowledges that some of the best and highly motivated hospital corpsmen in Navy Medicine are at NMRC. "They receive intensive training on the methodologies and procedures to perform polymerase chain reaction and enzyme-linked immunosorbent assay testing. NMRC sailors train worldwide with U.S. and Allied forces directly supporting continuous refinement to operational



## Professional Development in BW Defense for Navy Microbiologists

The Navy Medicine Director's Training in Biological Warfare (BW) is a full-time in-service Duty Under Instruction opportunity for microbiologists. The program is designed to develop officers with expertise in BW countermeasure research, biological defense operations, and relevant Navy, Department of Defense, and federal government policy. Each fellowship in the program is competitively awarded to a Navy microbiologist for an 18-month student billet at the Navy Medicine Professional Development Center, but the actual training is with the Naval Medical Research Center-Frederick's Biological Defense Research Directorate (NMRC-BDRD) at Ft. Detrick, Md.

The current BW fellow, Lt. Andrea McCoy, who is the sixth since the program began, said, "The opportunity for diverse training within the fellowship is a major benefit to the program. Often we get so focused in what we do, as a microbiologist, we forget that our work is just a small piece of a much larger collaboration. Having a global understanding of how we plan for CBRNE [chemical, biological, radiological, nuclear and enhanced conventional weapons] and disaster response events; how we collect intelligence to deter an event; or how local, state and federal agencies will respond to a domestic or overseas



*Lt. Cmdr. Michael Stockelman (left) and Lt. Andrea McCoy, microbiologists and fellows in the Navy Medicine Director's Training in Biological Warfare.*

microbiology diagnostic skills with the operational environment."

McCoy also pointed out that BDRD's location is a strength of the program. BDRD recently relocated from NMRC headquarters in Silver Spring, Md. to Ft. Detrick, Md. on the National Interagency Confederation for Biological Research (NICBR), which

research.

The outgoing fellow, Lt. Cmdr. Michael Stockelman, is reporting to the Naval Research Laboratory (NRL) in May 2012.

"During my fellowship, I was the alternate Navy representative on an interagency committee at the NICBR, worked on a phage-based vaccine project, and trained in global health security issues and emergency preparedness concepts that guide planning and responses to biological and other potential mass casualty events," said Stockelman. "The expectations of these fellows are high since they will keep the Navy in the vanguard of biodefense response and research."

Biological warfare fellows design their program from a wide range of training opportunities, including live and online courses, conferences, workshops and on-the-job training at BDRD, USAMRIID and elsewhere. Accepting the fellowship also incurs a two and a half year service obligation in a follow-on tour, which can continue at BDRD, NRL, or a Navy Environmental and Preventive Medicine Unit.

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incident broadens my subject matter expertise beyond a technical expertise. However, it is just as important during this training that I provide to the different players my technical expertise and an awareness of NMRC-BDRD's capabilities so they can do their jobs better. Most microbiologists applying to this program want to combine their

houses the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and research groups from other U.S. government departments and agencies. With a year remaining in her fellowship, she is looking forward to training and field exercises with BDRD and its operational customers as well as performing select agent

# Navy Unit Visits San Antonio Elementary School to Celebrate Fiesta

By Joe N. Wiggins, NAMRU-San Antonio Public Affairs

In the Alamo city, which strives to welcome military members into its annual Fiesta San Antonio celebration, one Navy unit strove to give back to the community in a direct and personal way.

The Naval Medical Research Unit-San Antonio ([NAMRU-San Antonio](#)), as part of an effort involving all Navy units in the San Antonio area, reached out to one local school through direct involvement with the students and teachers.

Four sailors from NAMRU-San Antonio visited Sinclair Elementary School to read to the students, meet their teachers and staff, and participate in question-and-answer sessions about being in the Navy.

While the program was aimed at benefitting the students, the NAMRU-San Antonio participants came away personally rewarded from the experience.

"I was very impressed with the enthusiasm and excitement of the children seeing someone in uniform coming to visit them," said Capt. Vincent DelInnocentiis, commanding officer of NAMRU-San Antonio and one of the participants. "After reading stories to them, we took time to hear some of their questions. Their quizzical nature and the many questions you get about ships and being in the Navy were great," he added.

Not only was the skipper impressed with the students, so was one of the newest officers in the unit and in the Navy.

"Not having much experience with children, I was more terrified going to the elementary school than diving for my swimming test. I was surprised by some of the questions they asked about tactics and weapons," said Lt. Saima Raza, a research psychologist in the Directed Energy Biomedical Research department of NAMRU-San Antonio.

Also visiting the school was Capt. Steven Sidoff, head of the Dental and Biomedical Research department, and Cmdr. Shannon P. Voss, head of the



*Capt. Steven Sidoff, head of dental and biomedical research, reads to students at Sinclair Elementary School in San Antonio, Texas during Fiesta San Antonio.*

Directed Energy Biomedical Research department.

During the visit, the sailors got to interact with the teachers as well as the students.

"It was clear teachers and students alike appreciated our visit. Their curiosity about us and what we do in the Navy truly impressed me," said Raza.

When asked whether they would come back again given the opportunity, the reaction of the visitors was universal.

"Yes, I enjoyed interacting with the students. They are keen observers,"

said Raza.

"I've had the opportunity to visit the school several times, and always leave thinking I'm glad I came," added DelInnocentiis.

The 11-day annual Fiesta celebration, which is structured around more than 100 official events, seeks as one of its goals to benefit local residents through raising funds for scholarships, mentoring programs and educational activities. Sponsored by nonprofit and military organizations, the activities often focus on community involvement and participation.



"This will be a platform where researchers will be recognized for their exemplary contributions to the warfighter and translational medicine," Ponzio said. "NMRC is a very fruitful spring and there is all kinds of great [research] coming out of here!"